

AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended): A command synchronization establishment system using comprising:

a network wherein a cycle master node managing time on the network periodically transmits a cycle start packet including time information to each node connected to the network, each node synchronizes its clock in accordance with the time information included in the cycle start packet so as to assure isochronism on the network by sharing the synchronized clock with each other node, data is transferred by an isochronous isochronous transfer, and a command is transferred by an asynchronous transfer, and synchronized clock is shared by apparatuses connected to the network, the system comprising:

a controller connected to the network, comprising a transmitter that transmits a command including a time-stamp based on the shared clock to a target apparatus by using the asynchronous transfer; and

the target apparatus connected to the network, comprising a receiver that receives the command, a storage device that temporally stores the received command in order not to execute the received command instantly, a transmitter that transmits a response to the controller reflecting that the received command will be executed when a current time based on the shared clock reaches a time represented by the time-stamp included in the command, and a executing device that executes the received command in accordance with when a current time based on the shared clock reaches the time represented by the time-stamp included in the command to be executed, and a replying device that provides a response indicating completion of executing the command.

Claim 2 (currently amended): A command synchronization establishment system according to claim 1, comprising:

a network wherein a cycle master node managing time on the network periodically transmits a cycle start packet including time information to each node connected to the network, each node synchronizes its clock in accordance with the time information included in the cycle start packet so as to assure isochronism on the network by sharing the synchronized clock with each other node, data is transferred by an isochronous transfer, and a command is transferred by an asynchronous transfer;

a controller connected to the network, comprising a transmitter that transmits a command including a time-stamp based on the shared clock to a target apparatus by using the asynchronous transfer; and

the target apparatus connected to the network, comprising a receiver that receives the command, a storage device that temporally stores the received command in order not to execute the received command instantly, a transmitter that transmits a response to the controller reflecting that the received command will be executed when a current time based on the shared clock reaches a time represented by the time-stamp included in the command, wherein said and an executing device that executes the received command when before a current time based on the shared clock reaches to a the time represented by the time-stamp included in the command to be executed and validates a result of the execution of the received command when a current time based on the shared clock reaches the time represented by the time-stamp.

Claim 3 (canceled)

Claim 4 (currently amended): A command synchronization establishment system according to claim 1, wherein said each node connected to the network shares the clock with each other node by copying the time information included in the cycle start packet to a cycle time register in each node, and

said time-stamp included in the command is in a format including a part or all formats of the cycle time register of a format of a cycle time register of the synchronized clock for sharing a current time by the devices connected to the network.

Claim 5 (currently amended): A command synchronization establishment system according to claim 1, wherein said command includes a flag instructing the executing device to execute the command instantly or when a current time reaches to-a the time represented by the time-stamp included in the command, and the target apparatus determines whether to execute the received command instantly or when a current time reaches the time represented by the time-stamp in accordance with the flag.

Claim 6 (original): A command synchronization establishment system according to claim 5, wherein the flag uses a part of a format of the time-stamp included in the command.

Claim 7 (currently amended): A command synchronization establishment method using a network wherein a cycle master node managing time on the network periodically transmits a cycle start packet including time information to each node connected to the network, each node synchronizes its clock in accordance with the time information included in the cycle start packet so as to assure isochronism on the network by sharing the synchronized clock with each other node, data is transferred by an isochronous isochronous transfer, and a command is transferred by an asynchronous transfer, and a synchronized clock is shared by apparatuses connected to the network; the method comprising the steps of:

transmitting a command including a time-stamp based on the shared clock to a target apparatus by using the asynchronous transfer from a controller connected to the network;

receiving the command by the target apparatus connected to the network;

temporally storing the received command in order not to execute the received command instantly; and

transmitting a response to the controller reflecting that the received command will be executed when a current time based on the shared clock reaches a time represented by the time-stamp included in the command;

executing the received command in accordance with when a current time based on the shared clock reaches the time represented by the time-stamp included in the command to be executed; and

providing a response indicating completion of executing the command.

Claim 8 (currently amended): A controller for a command synchronization establishment system connected to a network to which a target apparatus is connected, said target apparatus comprising a receiver that receives the command, a storage device that temporally stores the received command in order not to execute the received command instantly, and a transmitter that transmits a response to the controller reflecting that the received command will be executed when a current time based on a shared clock reaches a time represented by a time-stamp included in the command, and a an executing device that executes the received command in accordance with when a current time based on the shared clock reaches the time represented by the time-stamp included in the command to be executed, and a replying device that provides a response indicating completion of executing the command, is connected; and wherein a cycle master node managing time on the network periodically transmits a cycle start packet including time information to each node connected to the network, each node synchronizes its clock in accordance with the time information included in the cycle start packet so as to assure isochronism on the network by sharing the synchronized clock with each other node; data is transferred by an isoehroous isochronous transfer, and a command is transferred by an asynchronous transfer; a synchronized clock is shared by apparatuses connected to the network, the controller comprising:

a transmitter that transmits a command including a time-stamp based on the shared clock to the target apparatus by using the asynchronous transfer; and

a receiver that receives the response reflecting that the received command will be executed when a current time based on a shared clock reaches a time represented by a time-stamp included in the command and that receives the response indicating completion of executing the command.

Claim 9 (currently amended): A target apparatus for a command synchronization establishment system using a network to which a controller comprising a transmitter that transmits a command including a time-stamp based on a shared clock to a the target apparatus by using the asynchronous transfer is connected, and wherein a cycle master node managing time on the network periodically transmits a cycle start packet including time information to each node connected to the network, each node synchronizes its clock in accordance with the time information included in the cycle start packet so as to assure isochronism on the network by sharing the synchronized clock with each other node, data is transferred by an isochroous isochronous transfer, and a command is transferred by an asynchronous transfer; and a synchronized clock is shared by apparatuses connected to the network, the target apparatus comprising:

a receiver that receives the command;

a storage device that temporally stores the received command in order not to execute the received command instantly; and

a transmitter that transmits a response representing to the controller reflecting that the received command will be executed when a current time based on the shared clock reaches a time represented by the time-stamp included in the command;

a an executing device that executes the received command in accordance with when a current time based on the shared clock reaches the time represented by the time-stamp included in the command to be executed; and

a replying device that provides a response indicating completion of executing the command.

Claim 10 (currently amended): A command synchronization system, ~~using a network wherein data is transferred by an isochroous transfer, a command is transferred by an asynchronous transfer, and a synchronized clock is shared by apparatuses connected to the network, the system comprising:~~

means for networking nodes wherein a cycle master node managing time on the network periodically notifies a cycle start packet including time information to each node connected to the network, each node synchronizes its clock in accordance with the time information included in the cycle start packet so as to assure isochronism on the network by sharing the synchronized clock with each other node, data is transferred by an isochronous transfer, and a command is transferred by an asynchronous transfer;

means for transmitting a command including a time-stamp based on the shared clock to a target apparatus by using the asynchronous transfer from a controller connected to the network;

means for temporally storing the received command in order not to execute the received command instantly; and

means for transmitting a response to the controller reflecting that the received command will be executed when a current time based on the shared clock reaches a time represented by the time-stamp included in the command;

means for executing the received command in accordance with when a current time based on the shared clock reaches the time represented by the time-stamp included in the command to be executed; and

means for providing a response indicating completion of executing the command.